Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims:

Claims 1-21 (canceled)

Claim 22 (new): A method of improving the thermal stability of a compound semiconductor material comprising:

depositing a layer of said compound semiconductor material including therein acceptors; and

wherein said acceptors have an electronic energy level below the midgap energy level of the neutral antisite defects of said compound semiconductor material; and

wherein the concentration of said acceptors is balanced with the concentration of said antisite defects; and

wherein said improved thermal stability is such that the properties of said compound semiconductor material are substantially unaffected by subsequent high temperature processing of said compound semiconductor material.

Claim 23 (new): A method as in claim 22 wherein said compound semiconductor material is selected from the group consisting of III-V semiconductor material, InGaAs and AlGaP.

Claim 24 (new): A method as in claim 22 wherein said acceptors are selected from the group consisting of C, Be, Zn, Mg, Fe, Cu, Mn and Ni.

Claim 25 (new): A method as in claim 22 wherein said acceptors are Be and said compound semiconductor material is LT-GaAs.

Claim 26 (new): A method as in claim 25 wherein said LT-GaAs is deposited by molecular beam epitaxy at a temperature in the range from approximately 200°C to approximately 400°C; and

wherein said LT-GaAs is doped during growth with Be at a temperature greater than approximately 230°C.

Claim 27 (new): A method of producing a compound semiconductor material having short carrier trapping times comprising:

depositing a layer of said compound semiconductor material including therein acceptors; and

wherein said acceptors have an electronic energy level below the midgap energy level of the neutral antisite defects of said compound semiconductor material; and

wherein the concentration of said acceptors is balanced with the concentration of said antisite defects; and

wherein said carrier trapping times are less than the carrier trapping times of said compound semiconductor material lacking said acceptors.

Claim 28 (new): A method as in claim 27 wherein said compound semiconductor material is selected from the group consisting of III-V semiconductor material, InGaAs and AlGaP.

Claim 29 (new): A method as in claim 27 wherein said acceptors are selected from the group consisting of C, Be, Zn, Mg, Fe, Cu, Mn and Ni.

Claim 30 (new): A method as in claim 27 wherein said acceptors are Be and said compound semiconductor material is LT-GaAs.

Claim 31 (new): A method as in claim 25 wherein said LT-GaAs is deposited by molecular beam epitaxy at a temperature in the range from approximately 200°C to approximately 400°C; and

wherein said LT-GaAs is doped during growth with Be at a temperature greater than approximately 230°C; and

wherein said carrier trapping times are less than approximately 5.5 picoseconds.